Gastroduodenostomy After Gastric Resection

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• Gastroduodenostomy after gastric resection is a procedure which can be readily performed if the short gastric vessels are first divided. It makes for a more physiological restoration of the gastrointestinal tract than is accomplished with gastrojejunostomy and permits proper admixture of the food with the bile and pancreatic enzymes. It avoids several potential dangers such as leakage from the duodenal stump, the possibility of a gastrocolic fistula, and malfunction of the anastomosis due to distortion of a jejunal loop. Apparently the "dumping syndrome" does not occur after gastroduodenostomy as it sometimes does after gastrojejunostomy.

ANASTOMOSIS of the duodenum to the gastric stump, a procedure originated by Bilroth and fully described in the literature, has been employed by the authors for three basic reasons: It restores physiologic continuity of the gastrointestinal tract; it eliminates one step, closure of the duodenal stump; and it eliminates two potential hazards, leakage from the duodenal stump and the possibility of a gastrocolic fistula.

The results have been gratifying. There have been no postoperative deaths, only one serious postoperative complication (hemorrhage from the suture line), and no complications such as anastomotic ulcers, stenosis of the suture line, or the so-called "dumping syndrome."

MATERIAL

Gastroduodenostomy was carried out in 33 patients (6 women and 27 men) between the ages of 22 and 76 in the period of three years. Twenty-five of the patients had duodenal ulcers, six had gastric ulcers and two had gastric carcinomas. The patients with ulcers had the usual indications for operation—massive hemorrhage, pyloric obstruction, or intractability.

OPERATIVE TECHNIQUE

Following is a description of the operative technique used by the authors:

The gastrocolic omentum is divided and the pylorus and first portion of the duodenum freed to below the level of the ulcer. The gastrohepatic omentum is opened, the right gastric vessels divided and ligated, and the superior border of the pylorus and duodenum freed. A clamp is placed across the duodenum below the ulcer and the duodenum divided distal to the clamp so that the distal end of the duodenum is not crushed. To prevent spillage, the stump is temporarily closed with several Babcock clamps. The left gastric artery is identified near the entrance of the esophagus into the stomach and divided and tied. All the vessels along the greater curvature, including the short gastric vessels between the stomach and spleen, are then divided. It is imperative that this last step be done, for otherwise the stump of the stomach will remain high under the costal margin and cannot be brought down to meet the duodenal stump.

After division of the short gastric vessels, the stomach will drop into the operative field and literally hang from the esophagus. Despite this apparently massive ligation of the arterial supply of the stomach, it has always been noted that the color of the upper one-fourth remains good, and that if any of the submucosal vessels are cut there is an abundant flow of blood. A Payr clamp is placed across the stomach so that all of the lesser curvature and most of the greater curvature lies distal to it. In other words, between 75 and 80 per cent of the stomach will be amputated, leaving only the cardia.

Incision is then made through the serosa and muscularis on the proximal side of the clamp, the submucosal vessels exposed and individually suture-ligated with No. 80 cotton to prevent postoperative hemorrhage. Beginning at the lesser curvature, the stomach is cut across for about a third of its distance and that portion of the stump of the stomach is inverted with a single layer of No. 60 cotton interrupted sutures of inverting type. Division of the stomach is continued along with closure of the stump until the residual opening approximates in size the opening in the duodenum. The duodenum is anastomosed to the stump of the stomach with a single layer of No. 60 cotton interrupted sutures of inverting type. Extra sutures are placed at each of the critical points—the two corners and the points at which the two suture lines join.

Postoperatively, a Levine tube is left in the gastric stump for 24 hours and then removed. The patient

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is permitted to take 2 ounces of fluid every half hour, as tolerated. At this time the patient is carefully instructed to take liquids slowly and not to take any if he feels the least fullness or discomfort. The oral intake of food is increased rapidly by the addition of cereals, soft boiled eggs, pureed vegetables, custards, and the like, until at the end of about five days the diet is that usually prescribed for an ambulatory patient with gastric ulcers. During the first week, feedings are at two-hour intervals. After the first week they are changed to six times a day. Throughout this entire stage, it is constantly emphasized to the patient that he must eat slowly and must stop eating if he has even a slight feeling of fullness or discomfort. This is very important, for with this kind of anastomosis vomiting occurs if the gastric stump becomes even a little distended. The diet commonly used for ambulatory patients with gastric ulcer is maintained for approximately four weeks, after which patients are permitted to eat any foods which agree with them and to eat according to any schedule that will maintain their weight.

RESULTS

There were no postoperative deaths. One patient had bleeding of serious proportions from the suture line, which was readily controlled by Gelfoam® powder and Thromboplastin.® There were no other major postoperative complications, and there were no cases of postoperative gastric retention or dilation. The late postoperative course of the patients was exceedingly satisfactory. The only difficulty encountered was a tendency on the part of a few to vomit after meals. In each instance this was owing to violation of instructions to eat slowly and to take at least 30 minutes for each meal.

In postoperative x-ray studies, a small gastric pouch, indicative of an adequate resection, was observed in all cases. The duodenum did not become distended upon ingestion of barium, and the gastric pouch did not empty too rapidly.

DISCUSSION

In any operative procedure on the gastrointestinal tract, the goal, in addition to restoring continuity, should be to restore, as nearly as possible, a physiologic state. This, it is believed, is more closely approached with gastroduodenostomy after gastric resection than with gastrojejunostomy. After gastroduodenostomy, food passes from the stomach into the duodenum, stimulating the flow of bile and pancreatic juices, and thus permits the food to mix directly with these enzymes as it passes on into the jejunum; whereas after gastrojejunostomy the food is dumped directly into the jejunum, and mixture with the bile and pancreatic enzymes takes place during its passage through the jejunum. Digestion and absorption of digested food should be more efficient in the patient with gastroduodenostomy. This was seemingly borne out by the fact that, in the patients in the present series, maintenance of weight and weight gain were no problem at any time.

In a comparison of x-ray studies made on patients with gastroduodenostomies and on patients with gastrojejunostomies, a somewhat slower emptying of the gastric pouch after gastroduodenostomy was noted. Another feature was that there was no distention of the duodenum at any time after gastroduodenostomy. The "dumping syndrome" was not noted in any of the patients in the present series, probably owing to the delay in emptying through the duodenal anastomosis, but there was a tendency for patients to regurgitate food if they ate too fast. The authors look upon regurgitation when the stomach is overdistended as protection of the patient against the dumping syndrome.

Gastroduodenostomy also eliminates several potential difficulties, such as the obstructive problems which occasionally arise after gastrojejunostomy from a twisted or distorted loop of jejunum, and the possibility of a gastrocolic fistula due to the development of an anastomotic ulcer. In gastroduodenostomy, the suture line is at a distance from the colon and, should an anastomotic ulcer develop, the likelihood of adherence to the colon with development of a fistula is remote. From a technical standpoint the procedure has several advantages—it eliminates one step, the closure of the duodenal stump—and with that a potential danger, leakage from the duodenal stump. The only technical problem added by the procedure is one of division of the short gastric vessels which sometimes can be difficult because of their location, high under the costal arch. It is appreciated that gastroduodenostomy is not possible in all cases after gastric resection, but the authors believe it can be done in most cases and should be used more often.

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